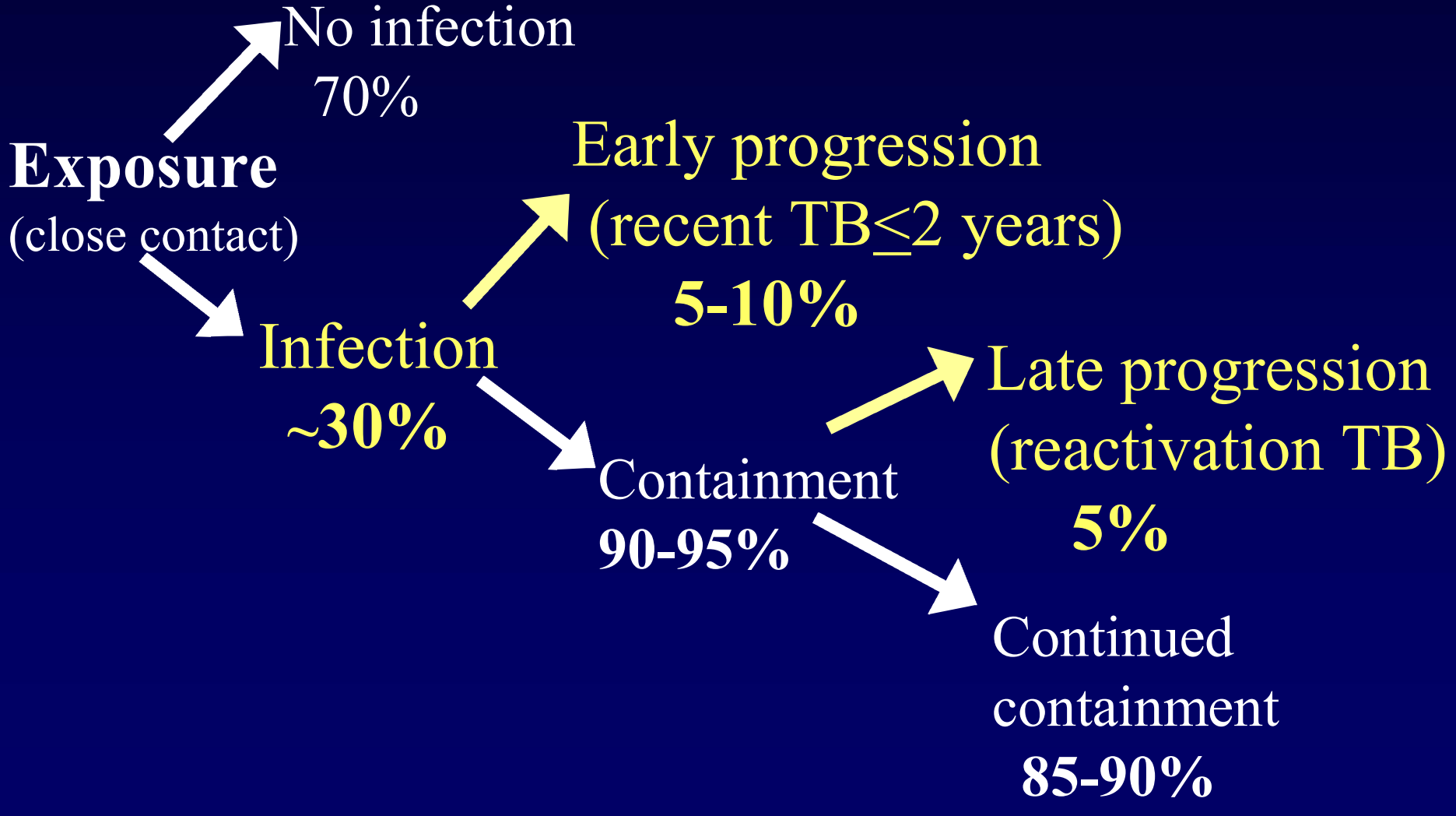
TB Outbreak Investigation in Fishery Workers, Maryland

Cassandra Althauser
PHASE Internship
Maryland Department of Health and Human Hygiene

Airborne Transmission

- Tuberculosis
  - Small droplet nuclei (<5 microns)
  - Can remain suspended in the air for long periods
  - Float on dust particles
  - 20-30% of close contacts will become infected
  - 5-10% of infected will progress to active TB

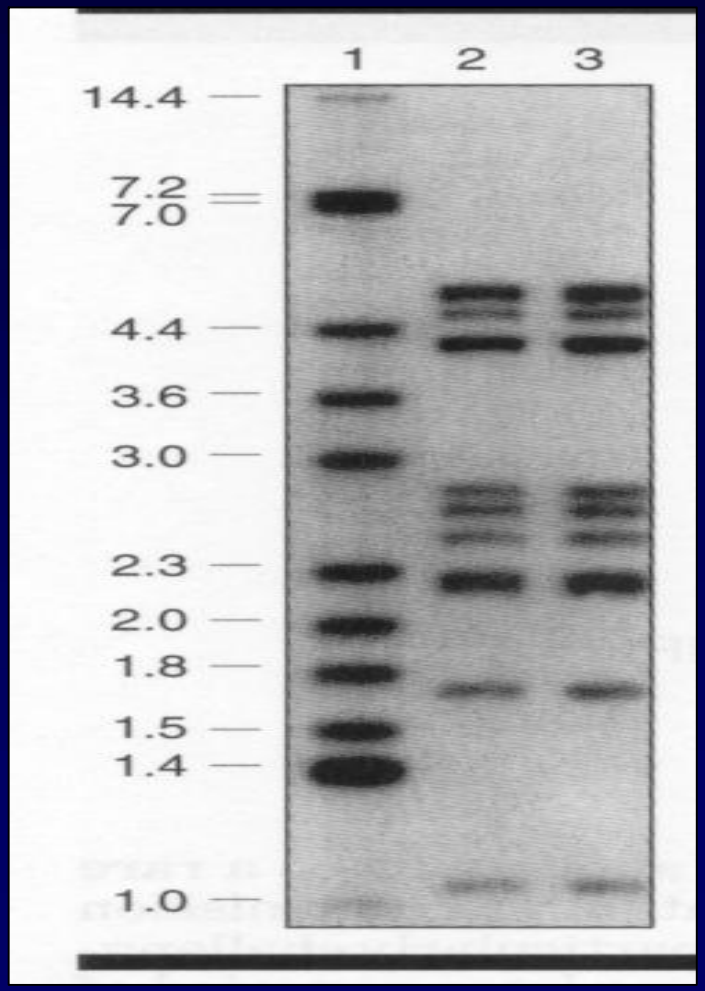
Risk of TB infection and disease among exposed individuals



Treatment of Latent TB Infection (TLTBI)

- Individuals at high risk of active disease
- Medication for prolonged period
  - Mainly, INH for 9 months (hepatotoxicity)
  - Other regimens are now available
- Prevents the development of TB disease 90% of the time

Using Genotyping to Detect Transmission

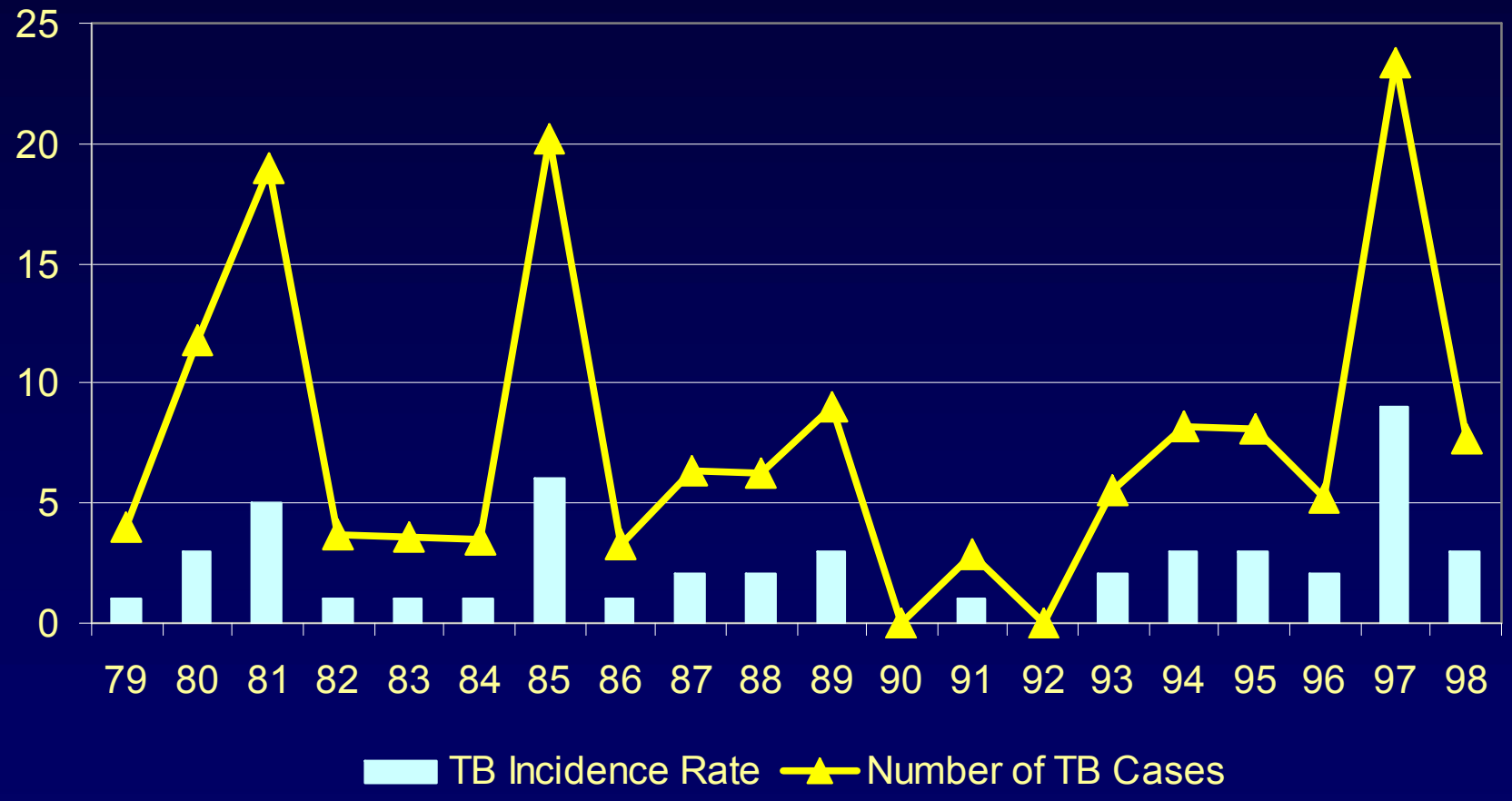


- TB transmission from one patient to another
- IS*6110* RFLP patterns
  - Lane 1: Lab Standard
  - Lane 2: Patient A
  - Lane 3: Patient B

Background

- Between 1980 and 1998 there were 3 TB outbreaks among fishery workers in Queen Anne's County, MD.
- In 1996, Queen Anne's County had the highest incidence rates of TB in the entire state (23.1 versus 6.6 per 100,000)

Number of TB Cases and Rates
Queen Anne's County, Jan '79 – June '98



Objectives of the Internship

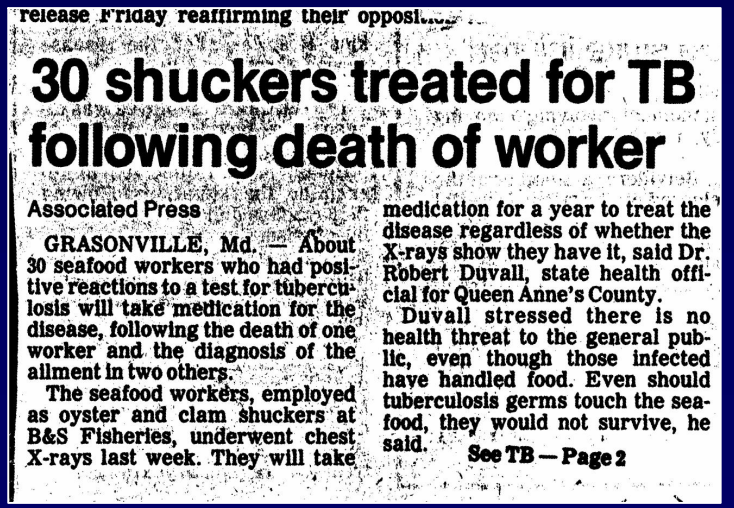
- To describe the outbreak history and current surveillance data.
- To summarize the transmission patterns of the cluster and to determine any additional TB cases linked to the cluster.
- To describe the public health intervention by the local health department taken to eliminate further outbreaks.

Methods

- Review of medical and contact investigation records
- Review of newspaper articles and other documents from the outbreak period
- Genotyping database review
  - Searched for similar genotypes
  - Collaborated with Delaware and Virginia TB Control Units
- Interviews with local health department staff and owners of the fishery house
- Observation of intervention activities

A Reoccurring Outbreak

- Newspaper articles indicated the problem had been an issue since the 1980's
- Cases from the 1996-1998 outbreak were listed as contacts in previous outbreaks
- The source case for the 1996 outbreak was found to be TST positive in 1976



release Friday reaffirming their opposi...

30 shuckers treated for TB following death of worker

Associated Press

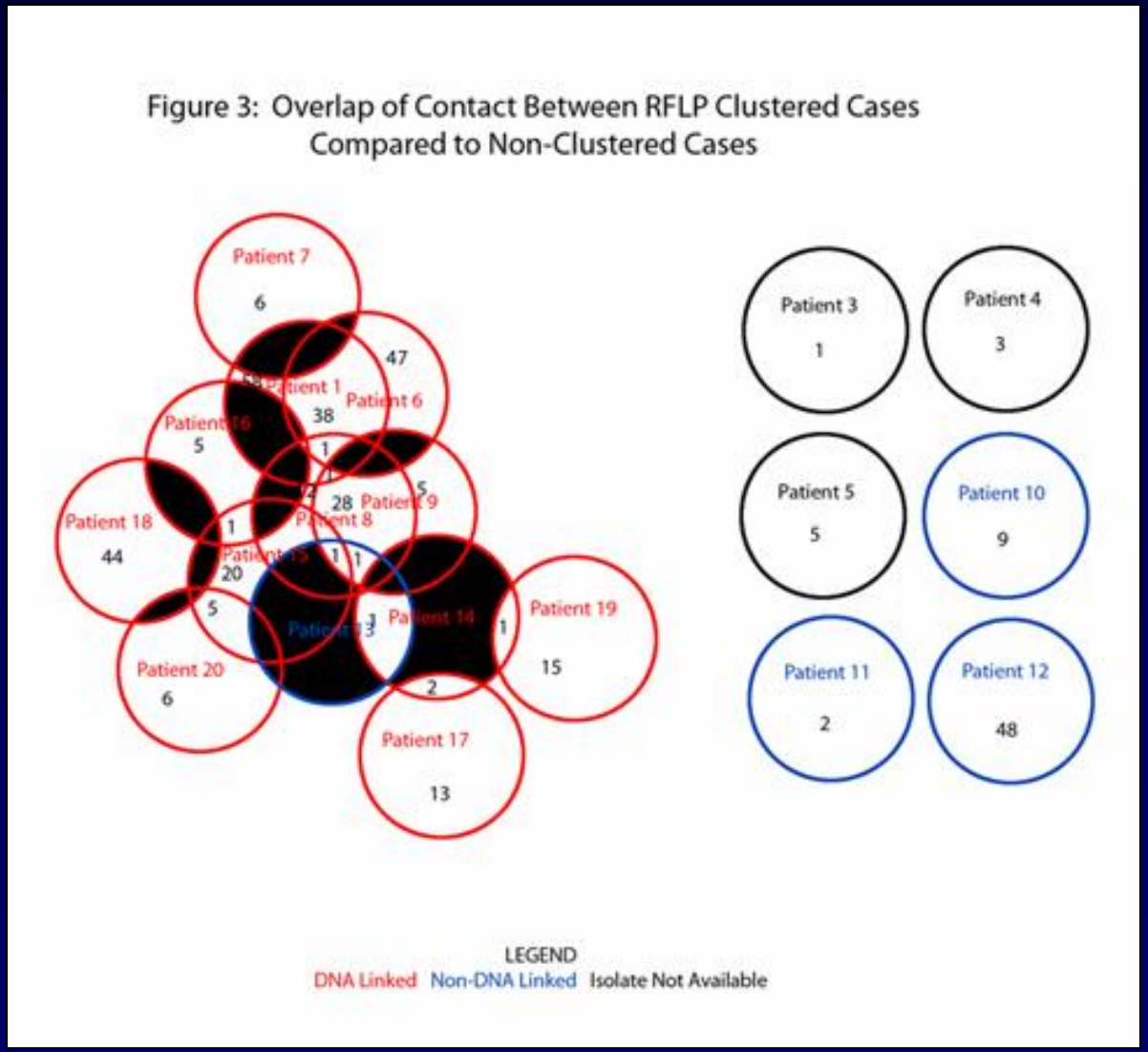
GRASONVILLE, Md. — About 30 seafood workers who had positive reactions to a test for tuberculosis will take medication for the disease, following the death of one worker and the diagnosis of the ailment in two others.

The seafood workers, employed as oyster and clam shuckers at B&S Fisheries, underwent chest X-rays last week. They will take medication for a year to treat the disease regardless of whether the X-rays show they have it, said Dr. Robert Duvall, state health official for Queen Anne's County.

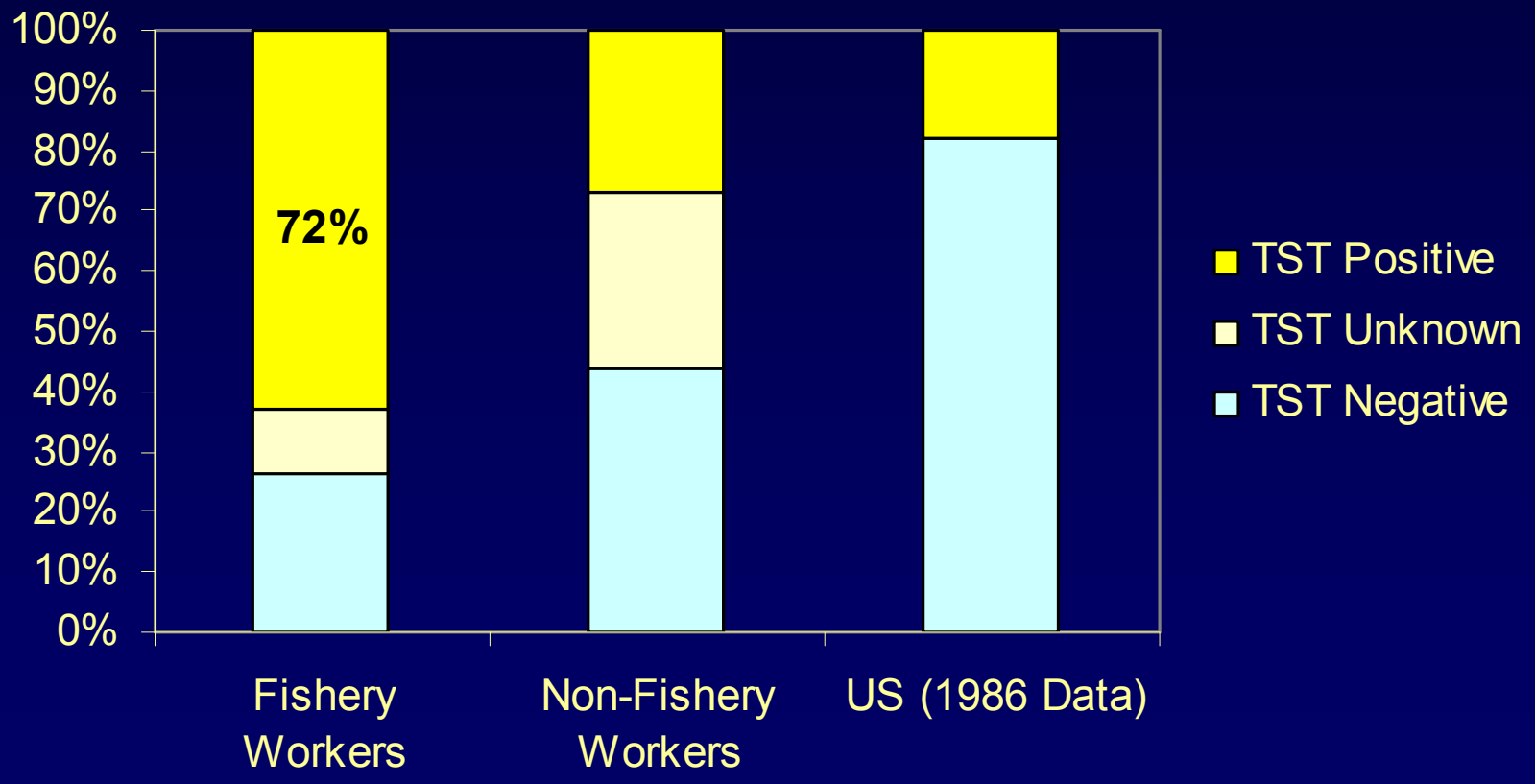
Duvall stressed there is no health threat to the general public, even though those infected have handled food. Even should tuberculosis germs touch the seafood, they would not survive, he said.

See TB — Page 2

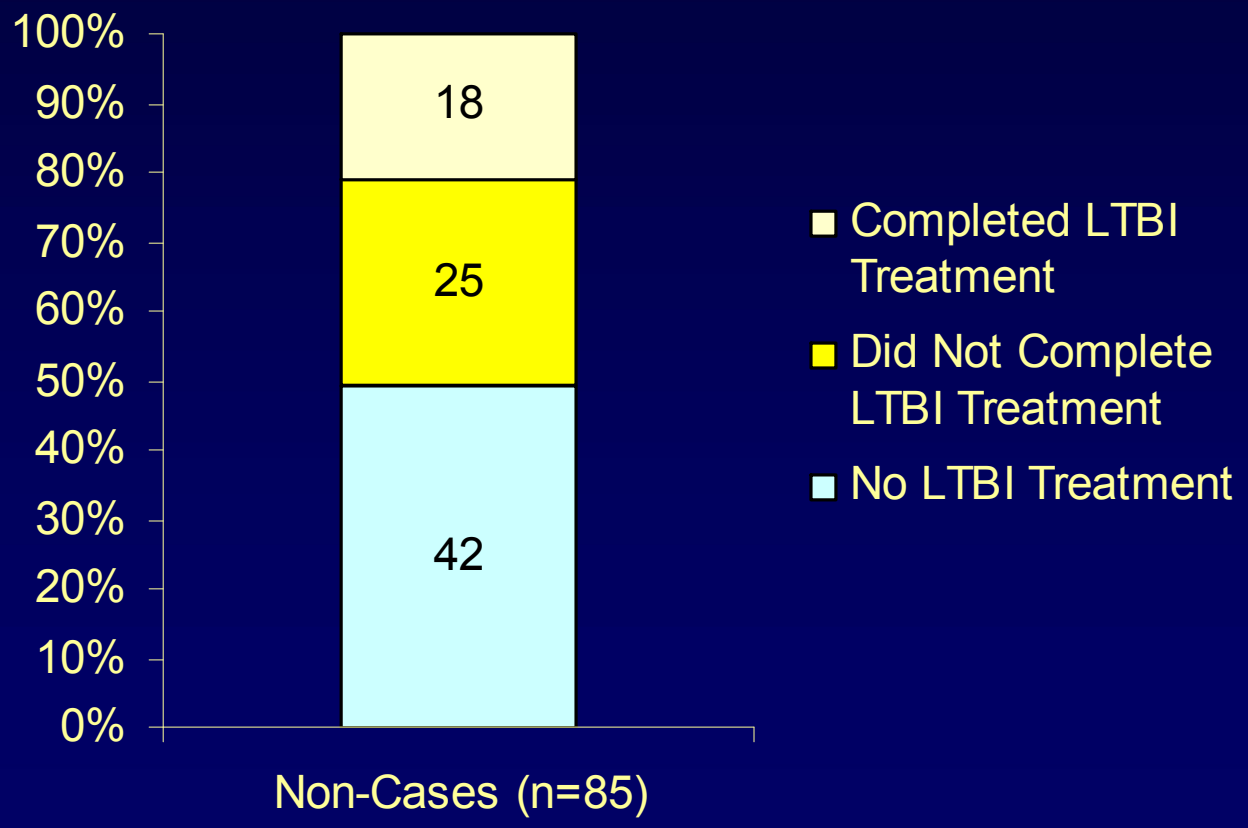
The 1996 Outbreak



Proportion of TST Positivity Among Contacts Jan '95 - April '98



Percent LTBI Treatment Completion Among Eligible TST Positive Contacts (January 1995 - April 1998)



Results: Genotyping Database Review

- No matching genotypes were found
  - Maryland – 1595 isolates reviewed
  - Virginia – 494 isolates reviewed
  - Delaware – 12 isolates reviewed

Results: Local Health Department Intervention

- Active case finding
  - Annual sputum collection at fishery houses
- Improved reporting mechanisms
- Dedication of local health department staff
- Baseline TST
- Educational program for local physicians
- Part-time nurse hired
- Actively built relationships with local fishery managers

Key Issues

- Underserved populations
- An evolving at-risk population
- Treatment for latent infection
- Genotyping project & multi-state outbreaks
- Active case finding & effectiveness of the intervention

Underserved Populations

- A need to identify and describe TB outbreaks in underserved populations, including the poor, rural, and immigrant
- TB rates for African Americans are 8.3 times that for Whiles
- African Americans with TB are more likely to have excess alcohol or drug use
- TB interventions often only access to healthcare

An Evolving Population

- 53.7% of TB cases are from foreign-born individuals
- 41% of those cases are from Central & South America and the Caribbean
- Hispanics now make up 50% of the fishery population
- A mix of TB with social services
- Translation
- Culturally sensitive interventions

Treatment for Latent Infection

- Only 13% of this cohort underwent LTBI treatment
- Prevailing reason was fear of risk of liver damage
- How to convince an alcoholic population?

Genotyping & Multi-State Outbreaks

- CDC-sponsored genotyping project was critical
- Relationships between cases with the same strain, which would have otherwise been missed, were identified.
- Important to periodically compare genotype patterns beyond local jurisdictions

Active Case Finding & Effectiveness of the Intervention

- The strikingly high rate of TB infection and disease
  - Needed a new approach to control it
- A need to address a delay in TB diagnosis
- Active case finding was most appropriate for this situation (vs. enhanced case finding or treatment of LTBI).

Lessons Learned

- State & local health department partnership and inter-state partnership
- The components of a strong intervention
- The need to address changing populations

Acknowledgements

- Wendy Cronin, PhD
- Jessie Torgersen, MHS
- Judy Barnes, RN
- Maryanne Thompson, RN